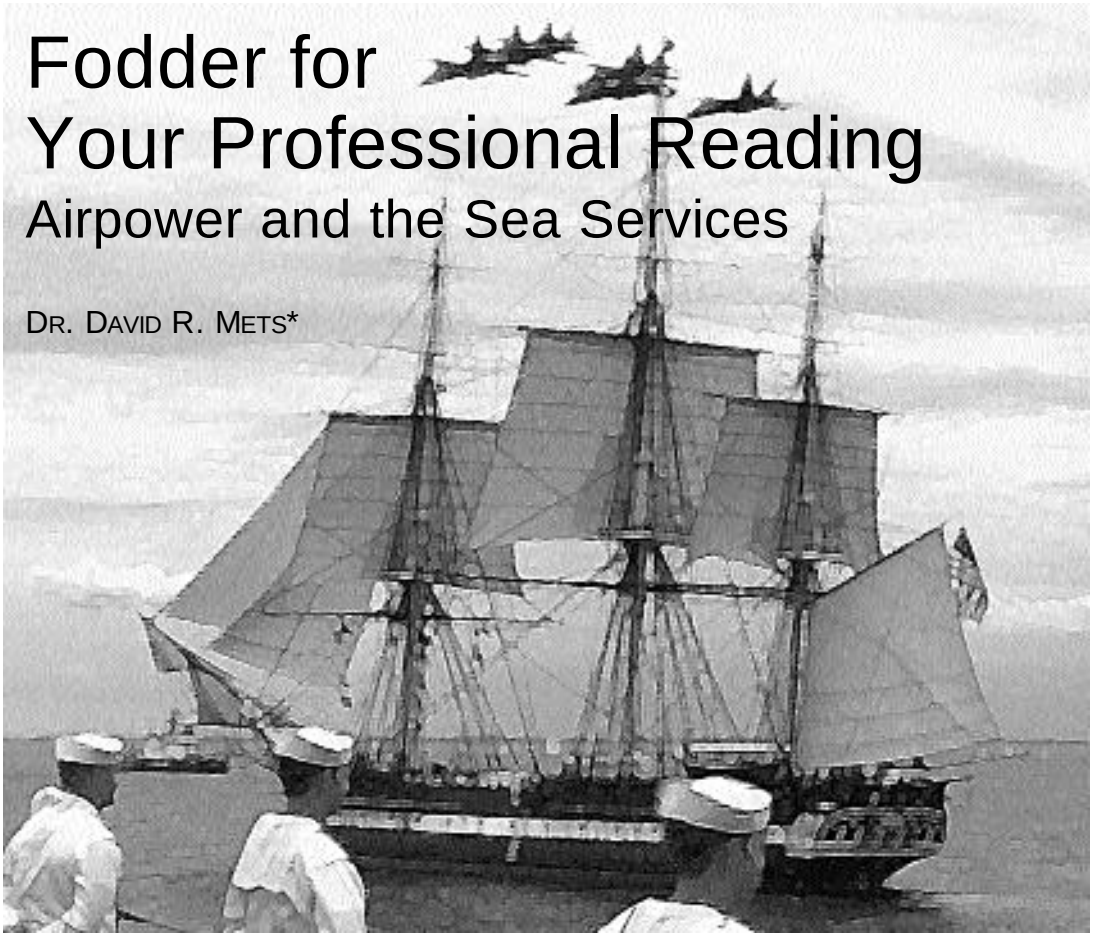
Fodder for Your Professional Reading

Airpower and the Sea Services

DR. DAVID R. METS*



WHY IN THE WORLD would a young Air Force warrior-scholar want to use up precious professional reading time examining the story of airpower and the sea services? I suppose that one could build a case that such an endeavor is even more important than going further in studying the history of one's own service. Just about everyone coming out of the officer-accession programs already knows who Billy Mitchell and Hap Arnold were, but how many among us could discuss the role of William Moffett or Joseph "Billy Goat" Reeves? Yet, many of us are destined to serve in joint assignments with sea-service colleagues raised on a diet of Moffett, Reeves, and Midway. Thus, one finds some utility in a study of maritime airpower, if only to create a vocabulary for communicating with our joint brethren. If one of them stated that "Schweinfurt proves . . . ," most of us would have some idea of whether we should challenge that assertion. But were he to argue that "Leyte Gulf proves . . . ," how many of us could step forward to question him?

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More important, what if one day you are a joint force air component commander (JFACC) or one of his or her staffers? What if the JFACC works for a naval commander in chief (CINC) at Pacific Command or a Marine CINC at Central Command? Would you need to know more about the character of maritime airpower than you do now? What if one day an Air Force officer becomes a CINC and has both naval and marine component commanders working for him or her? Will that CINC need to know what Midway, Yankee Station, and "traps" are all about? Once the Tomahawks and F/A-18s cross the shoreline, do significant differences exist between them and F-16s or air-launched cruise missiles? Does a MiG know whether the missile that hits it came from an F-14 or an F-15? Is it essential, therefore, for the twenty-first-century air strategist to understand as much about airpower "from the sea" as any of its other forms?

The purpose of this article, then, is to give you some ideas about enhancing your professional reading program—widening its scope to give you some additional insight on airpower in the naval and maritime contexts. We begin with a summary of the naval experience with airpower, then offer minireviews of five new books that are mostly about airpower in the naval context, and conclude with a list of 10 books that would give you a fair start in the study of airpower as it relates to the US Marine Corps and Navy.

A Shoestring Primer on the Development of Airpower and the Sea Services

The Jeffersonian Era

Through most of American history, the United States has not been a major sea power. In the beginning, we had no hope of competing with Britain's Royal Navy; in any case, we had other fish to fry with our continental expansion and development. Our overseas commerce was important, but the threats to it were usually limited. In any event, it benefited from Pax Britannica, under which the Royal Navy made the seas somewhat safe for American commerce. So the vision that prevailed for most of the nineteenth century was Thomas Jefferson's preference for a small-ship navy whose main purpose was to defend the coasts and offer minimal protection to commerce. The main exception occurred during the American Civil War, in which the Union built up one of the world's great navies and used it to good effect in blockading the Rebels and assisting the Army with riverine operations and a few amphibious attacks.

The New Imperialists and Mahan

At the first centennial's end, a sea change occurred. Because the frontier closed in 1890, any expansion would have to be overseas. A vast maritime technological revolution took place during and after the Civil War: the Navy converted to steam propulsion and metal ships; submarines arrived even before World War I, along with practical torpedoes; the effectiveness of naval gunnery made a quantum jump; and coaling stations for both commercial and naval vessels became essential en route to overseas markets. As Alfred Thayer Mahan saw it, the function of the Navy was no longer merely coastal defense, commerce protection, and raiding. Rather, the service should now gain command of the sea through a great naval battle between capital ships, as in Trafalgar, where Adm Horatio Nelson had defeated the Napoleonic naval threat. This new function would require a great fleet of huge, heavily gunned ships of the line.

The Test of the Great War

The United States did not get into the war in time for the great battle of Jutland, and, in any event, that fight little resembled Trafalgar. The German U-boats demonstrated that a Jeffersonian-era assault on maritime commerce had more potential than Mahan thought and that conventional command of the sea could do little to stop it. So, no clear "lessons" of the naval war existed, and the US Naval Institute's *Proceedings* in the 1920s published many articles about Jutland and an equal number about the utility of naval aviation. Destruction of the German fleet deprived the US Navy of its main—almost only—threat.

Naval Aviation as an Auxiliary

The Navy of the 1920s was not nearly as Neanderthal as many Air Force officers seem to believe. True, most officers valued aviation as an enormous enhancement of the effectiveness of gunfire—and it was that. But some admirals even then had visions of aircraft ultimately becoming the main striking force. British carriers of the early 1920s were clearly ahead of their US counterparts, but by the end of the decade, America had the best naval aviation in the world, and the USS *Lexington* and *Saratoga* were the leading carriers. The end of that decade saw Pacific Fleet exercises in which air forces practiced attacks on both Pearl Harbor and the Panama Canal. Still, for most people, the main function of aviation was to win air superiority over the battle—and the best way of doing that was sinking the enemy carriers.

Hesitant Development of Naval Aviation as the Main Striking Force

Some doctrinal and organizational change followed the technical revolution that produced aircraft and carriers. The task force gradually replaced organization by ship type, and on the day of Pearl Harbor, the United States had eight battleships and seven aircraft carriers under construction. The flattops included the 27,000-ton *Essex* class that would win the naval air war in the Pacific. Arguably, only on the eve of war did carrier decks feature Dauntless dive-bombers with the capability of lifting a bomb big enough, carrying it far enough, and aiming it accurately enough to threaten the horizontal armor of most of the world's battleships.

Pearl Harbor and the Test of War

Pearl Harbor was defective as a test of Mitchell's theories for the same reason the 1921 tests proved inconclusive: the American battleships were immobile and undefended. However, the Japanese quickly sent the Royal Navy's *Repulse* and *Prince of Wales* to their watery graves even though they were moving, but without any air cover. During the war, though, battleships transitioned from the main striking arm to support roles as antiaircraft platforms and amphibious gunfire-support ships. The carriers quickly became the capital ships for both winning the sea battle and then projecting power ashore. Again, in 1945 the Japanese navy was in its watery grave, and the US Navy had lost its principal—and only—threat.

Revolt of the Admirals

The Navy for a time seemed to be a service without a mission. Nuclear attacks evidently said that air attack would decide the next war in a matter of hours; therefore, there would be no time for sea power to have an effect. Because the USSR was so heavily a land power, no other possible mission existed. That, in part, explains the viciousness of the

interservice rivalry surrounding the Unification Act and acquisition of the B-36. However, the Korean War not only opened the gates to the treasury but also showed that in the absence of jet fields, carriers could perform a very useful function in power projection ashore, notwithstanding the absence of any discernable naval threat.

The Blue-Water Navy and the Soviets

About the time the Navy began to make its case for power projection ashore in places like Korea, the Soviets provided that service with yet another reason for being: the building of a great submarine fleet, first to threaten the lines of communications to the North Atlantic Treaty Organization's member states, and then to threaten the American homeland itself with nuclear missiles. This mission remained viable for many decades afterwards, providing the rationale for sustaining great carrier and submarine fleets.

From the Sea

The collapse of the Soviet Union again deprived the US Navy of a threat upon which to build its house. The submarine fleet lost both its nuclear-attack role and its antisubmarine function. The carrier part of the Navy was somewhat better off because it could function in a conventional-attack role in many other areas of the world. But now an increasing focus on power projection ashore enhanced the brown-water parts of the Navy—the minesweeping and amphibious forces. So lately, one perceives the function

as establishing an enclave ashore to prepare for the follow-on heavy forces of the Army and Air Force.

The Jeffersonian Era

Some wonderful tales about American sea power existed before the Wright brothers came along. But for our first hundred years, naval power was not a high national priority. Even then, some leaders wanted to build great ships of the line. However, the population was small, the treasury usually bare, and Indians and outlaws on the frontier posed a more immediate problem than the great fleets of Europe. Our "Manifest Destiny" to expand preoccupied itself with filling up the continent for many years.

Thomas Jefferson's naval policy asserted that this country needed only a modest fleet of small ships and boats sufficient to protect its coasts and defend overseas commerce in a limited way. Although one must concede that this made sense, his policy briefly came to grief during the War of 1812, when enemy naval superiority allowed the British to sail up the Chesapeake and burn the White House. But even then, because the British could not establish naval superiority on the Great Lakes, the war ended in a standoff. For the rest of the period before Fort Sumter, not much need existed for a substantial navy—even then, the United States found refuge behind the peace maintained by the British Royal Navy. The conversion to steam, which began in that period, resulted in the founding of the US Naval Academy in 1845 to provide the requisite engineers.

The Union built up a very substantial fleet during the Civil War for both brown-water operations on the rivers and blue-water work on the high seas in blockading ports and chasing Rebel commerce raiders. Too, the ordeal of the Union stimulated more rapid technological change in the building of ironclads and even rotating turrets. But after the war, the US Navy quickly fell into stagnation that lasted for another 20 years or so.

The New Imperialists and

Photo courtesy of US Air Force.

Left to right: *Rear Adm William Moffett, Orville Wright, and Brig Gen William Mitchell, circa 1922. Moffett was the head of the Bureau of Aeronautics from 1921 until his death in an airship accident in 1933. His political and managerial skills were vital to the building of naval airpower during its first decade and more.*

Mahan

The industrial revolution in America started even before the Civil War, but it really got rolling after the agrarian South could no longer make its voice heard in Congress. Soon we built the railroads, populated the West, established the great manufacturing plants in the East, and witnessed the maturation of mechanized farms. These events, and many others, stimulated new interest in the overseas world. Because we needed new sources of raw materials, we had to find new markets.

All of that implied increasing involvement in trade routes and shipping, en route refueling stations, ship building and metallurgical industries, and a naval force to protect it all. Finally, the Republican Party, known for its responsiveness to the needs of big business, dominated politics for most of the period.

The Navy started stirring again in the 1870s—first with the founding of the Naval War College and the US Naval Institute and then with the beginning of the conversion to all-metal vessels (iron followed by steel). After abandoning sail propulsion, the service electrified the fleet and substantially improved its guns and gunnery. It also developed submarines and destroyers with the torpedoes to arm them. Gradually, the dedication to small Navy vessels like cruisers diminished, and battleships and dreadnoughts entered the fleet.

Brought up at West Point, where his father had been a professor of wide renown, Alfred Thayer Mahan attended Columbia University for a couple of years and then received advanced standing at the US Naval Academy. He remains the only person in the history of the institution who did not go through the freshman year. Mahan graduated in 1859, second in his class of 20.[1] After Mahan served blockade duty during the Civil

War, Stephen Luce recruited him to become a faculty member at the Navy's war college, then being set up in Newport, Rhode Island. Working mostly at the New York Public Library, Mahan prepared a series of lectures that became the basis of his course at Newport and also of his most famous work, *The Influence of Sea Power upon History, 1660–1783,* a smashing success.[2] Afterwards, he went back to sea only one time—to Europe, where he even received an audience with Queen Victoria.

Mahan was a favorite of the imperialists of his day, especially Theodore Roosevelt, assistant secretary of the Navy under President William McKinley. The performance of the Navy in the Spanish-American War seemed much more splendid than it really was, and the service earned a good deal of public affection. An assassin's bullet brought Roosevelt to the presidency—a great benefit to the Navy, which enjoyed further buildup during the initial decade of the new century, just as the Wrights were first learning to lift us from the ground.

Mahan argued that command of the sea was vital and that one could achieve it by winning a great sea battle between the main battle fleets. After that victory, everything else would follow almost automatically: the denial of enemy commerce, the freedom of friendly commerce, the free use of blockades, the ability to conduct amphibious invasions, and on and on. In short, whoever commanded the sea would rule the world. Among the corollaries to that principle was the urgent need for a great American battle fleet.

Thus, at the time that the Army had just emerged from its role as a force of Indian fighters, the Navy was riding high, wide, and handsome. The Army acquired its first motor vehicle in 1906 and contracted for its first airplane in 1907—the same year that Roosevelt sent the Great White Fleet on its voyage around the world. Clearly, the Navy remained the first line of defense. The service found itself in the midst of a whole string of technological revolutions that had begun before the Civil War and that continued rapidly under Roosevelt. Technical change, a relatively novel thing in the Army, became a way of life with the Navy. Too, the Navy had developed its war college to a very considerable stature by the turn of the century, but the Army War College arose only after the fiascoes of the Spanish-American War made clear the need. The US Naval Institute and its publication *Proceedings* already had existed for several decades, and war gaming at Newport had become quite mature. By the time of World War I, then, these events were conditioning the way that the naval service would meet yet another technological innovation—airpower. By then, the old split in the Navy's ranks between engineering and deck officers had healed, but the memory of such problems lingered strong in the minds of senior officers.

The Test of the Great War

In a short time, the Navy followed the Army into aviation. Even before World War I, the Navy had landed airplanes on and launched them from its ships, established a flying-training program, and actually used aircraft in combat at Vera Cruz, Mexico, in 1914. Airpower really did not figure in the one great sea battle in World War I, and naval aviators involved themselves in antisubmarine warfare (ASW) and in more conventional air fighting at the northern end of the Western Front.

No definitive lessons would emerge from such a limited experience, but pressure for the development of aviation rose to high levels in the Navy in the immediate aftermath of the war. Aviation had captured the imagination of everyone during the conflict—especially so in reaction to the horror and dreariness of trench warfare and the scarcity of great sea battles. Sailing back from Europe aboard the USS *Aquitania,* Billy Mitchell treated Capt Jerome Hunsaker, USN, to a full explanation of his vision for the future of aviation—which did not allow a great part for battleships or the Navy itself. Hunsaker and Mitchell himself both treated the

General Board of the Navy to this vision before the end of 1919. If the romance of it all were not enough, then the threat implied by Mitchell's schemes certainly helped stimulate the status of aviation in the naval service. If the admirals did not move swiftly in assimilating airpower to the Navy, then Mitchell would usurp it all for an independent air force. Indeed, they needed to look no further than the Royal Air Force, founded in 1918 and containing naval aviation.

Naval Aviation as an Auxiliary

Ships themselves were initially used as auxiliaries to the main striking arm in the Greek and Roman armies of ancient times. For many centuries they remained mere auxiliaries of the infantry, transporting soldiers to the scene of battle. But once they had closed with enemy vessels, the fight differed little from a battle on land. Only in the late sixteenth century did naval warfare become a battle between ships rather than among soldiers. So it was not at all unique that both the US Army and Navy first employed this new thing, the airplane, to enhance the effectiveness of older instruments of battle.

The term *battleship sailor* in more than just Air Force circles has become a euphemism for *unthinking, reactionary clod.* This is especially so among the intellectual heirs of Billy Mitchell. But I am sorry to report that in 1921 Billy may have been wrong and the battleship sailors right. It is true that the German battleship *Ostfriesland* went down under the force of the Air Service's 2,000 lb bombs and that the media got some splendid pictures of the sinking, leading to a field day in the press. But the ship was hard by the coast, stationary, and undefended. Pearl Harbor seemed to confirm that Mitchell's conclusions had been right. There too, however, the surprise attack caught the battleships at anchor, in narrow waters, and undefended either by antiaircraft artillery (AAA) or airplanes. Soon after, early in World War II, the Japanese caught the British capital ships *Prince of Wales* and *Repulse* at sea and under way. Both went to the bottom. But they too had no air cover, and the AAA was not as dense as it later became on battleships. The *Bismarck* was a tough nut to crack when the Royal Navy tried to run her down. When the British finally found her, their aircraft torpedoes disabled but did not sink her. The force, commanded by surface sailors, gave her the coup de grace with gunfire and torpedoes. When the US Navy caught the world's greatest battleship, the *Musashi,* in the narrow waters of San Bernadino Strait without any air cover in 1944, after the Japanese had been bled seriously for almost three years, it took 19 torpedo hits plus numerous bomb strikes to put her down.

The point is that the battleship sailors of 1921 and long after did have a case in logic. If Pearl Harbor had come at almost any time before 1940, *battleship sailor* might well have become a euphemism for *foresighted military leader.* As Thomas Wildenberg shows in his book *Destined for Glory,* reviewed below, it took the development of dive-bombing as a method of getting the accuracy needed and the acquisition of an aircraft like the Dauntless that could haul a heavy enough bomb a reasonable distance to make an impression on modern, horizontal battleship armor. The Dauntless did not turn up until 1940.

Meanwhile, aviation in a supporting role certainly did enhance the effectiveness of battleships. In the last decades before World War I, the development of newer and larger rifled barrels, new propellants, and more effective projectiles greatly extended the range of artillery. On land, artillery spotting became vital since guns far outranged eyesight from the trench level. Thus, spotting from the air became a vital advantage for ground generals. Consequently, they became the first to raise the cry for air superiority—to develop a permissive environment for their own spotters and deny it to the enemy's. Similarly, fire control at sea lagged gun range. Further, the United States remained well behind the Japanese and the British in the numbers of cruisers, a principal

function of which was scouting or long-range reconnaissance. Surface sailors well knew that they were not about to get much cruiser money out of Congress and were persuaded that carrier aircraft, land-based airplanes, or airships could do such scouting more rapidly and much more cheaply.

Even before the Great War, guns could hurl a 1,500 lb projectile far over the horizon. At first, fire control experienced improvement by centralizing it aboard ship and putting the fire-control officer high up in the superstructure. But that was not enough. Towed kites and balloons provided some thrilling rides for the spotters, but they were impractical. Using airplanes for spotting right after the Great War immediately revealed that the battleship fleet with air superiority would have a decisive advantage over its enemy. If one could make the environment safe for one's own spotters and lethal for the enemy's, one could destroy the enemy battle line before it could begin accurate fire itself. If the spotters could yield, say, only five miles in range advantage, that might well be enough. With the enemy battle fleet steaming at around 20 knots, firing at it for 15 minutes (assuming one was not steaming away from it) might well be enough to win the battle—and the war, according to Mahan. If one's aircraft could not sink enemy battleships but only slow them down by damaging or forcing evasive maneuvers on them, even that was all to the good.

So at first, battleship sailors thought they would need aircraft carriers to supply air superiority over the battle area and then reconnaissance and spotting services to make gunfire more effective. They quickly saw that the best way to achieve air superiority entailed sinking the enemy aircraft carriers. At the time of the Mitchell trial in 1925, however, the aircraft of the day did not have a prayer of carrying an appreciable bomb load out to battle distance or of consistently finding the enemy. Further, dive-bombing was not developed until 1927 and the decade that followed, and B-17s at Midway proved that hitting a maneuvering ship from level flight was very difficult if not impossible. The complete attrition of Torpedo Squadron 8 in the same battle indicated that that mode of attack was far from a free ride. Moreover, the addition of blisters to battleships to detonate torpedoes away from the main hull and the limitations of the size of the torpedo warhead limited its promise. These problems were partially solved by 1940, but by then the statute of limitations had run out for the *Ostfriesland* tests.

Hesitant Development of Naval Aviation as the Main Striking Force

Completed in December 1927, the *Lexington* and *Saratoga* became a factor in fleet exercises the following year. Before the end of the decade, carrier aircraft maneuvering at sea had run mock attacks against the Panama Canal. Long after, Adm John Thach recalled that he had participated in a surprise mock air attack against Pearl Harbor in the very early 1930s. For a long time, warships had been organized according to types: battleship or destroyer squadrons and the like. Starting in the early 1930s, though, the Navy began experimenting with task organization—a more or less permanent unit containing all types and built around an aircraft carrier. This became standard procedure during World War II and has persisted to the present. An associated development involved the press to get as many planes as possible aboard a given vessel and to raise their sortie rate to as high a level as possible. In the end, this gave US carriers a decided advantage over all others.

Air Force officers often do not appreciate the tight relationship between ship and aircraft design that exists in the Navy. For us, if the airplane becomes heavier, we just thicken the runway. If its landing distance increases, we just lengthen the runway. But on a carrier, once the flight deck attains a certain strength, then increasing it would require a truly major operation. Moreover, the size of the elevator limits the weight and size

of carrier aircraft. If the fill in aircraft bombs becomes too sensitive, then we in the Air Force just buy more real estate and store fewer of them in each igloo. But in the Navy, that is not an option. The size of the ship's magazine remains fixed—or nearly so.

When the *Lexington* and *Saratoga* joined the fleet, they used up almost half of the carrier tonnage granted the United States under the Washington treaties (66,000 of 135,000 tons allowed). So for a time, the Navy thought it best to make new designs smaller to get as many units as possible from the total allowance. Thus, the first American ship designed as a carrier from the ground up (both the *Lexington* and *Saratoga* started out as battle cruisers) was the *Ranger*—about 14,000 tons. As it turned out, this made her too slow and vulnerable for service in the wartime Pacific, so she stayed in the Atlantic throughout World War II. We built one more carrier about that size and then three of about 20,000 tons. The Navy appreciated the value of size long before Pearl Harbor and, when the Japanese attacked, had a design already in the shipyards that delivered a ship of 27,000 tons (*Essex* class), not far short of the *Lexington.* This increase in size enabled the development of the heavier Hellcat and Corsair fighters that made us more competitive with the Japanese Zeros—the source of so much trouble in the early days of the war. Thus, by the onset of war, we had the ships and some of the airplanes we would need, a doctrine for achieving air superiority and command of the sea, and a developing task-force organization that remains in use.

Pearl Harbor and the Test of War

The typical Air Force officer, it seems to me, knows a lot more about World War II in Europe than in the Pacific. The typical Navy officer, I am sure, knows much more about the Pacific war than the part of it in Europe. So, to some extent, when they find themselves on joint staffs, they tend to talk past each other—to speak with different vocabularies. The systemic and parochial reasons for this need not detain us, but Air Force warriors have good reason to give the Pacific more attention. A big part of our war in Europe was about the heavy bombing of large industrial centers—something not likely to happen again. Until the last year of the war, the fighting in the Pacific war featured tactical air operations and campaigns of limited size that may offer good instruction for the future. Finally, we should note that for a time in the early and even the middle part of the war, the United States had more forces deployed to the Pacific than to Europe.

One of the two main campaigns in the Pacific, the one through the Central Pacific, was very largely a naval war although it did involve vicious fighting ashore. The other, in the Southwest Pacific under the command of Gen Douglas MacArthur, was more of a land war but involved a very substantial naval and amphibious element. This situation probably violated the principle of mass, but either arm of that strategy usually outnumbered the Japanese, so it did not make that much difference. Although it is hard to say which campaign did more damage to the Rising Sun, no doubt our naval brethren tend to call the Central Pacific drive the main attack.

In any event, in part because of US naval competence, in part because of good fortune, and in part because of an intelligence coup, the Battle of Midway put a severe dent in Japanese airpower, especially naval airpower, its stronger form. Soon after in the Solomons campaigns, we further decimated Japan's naval airpower. The Battle of the Philippine Sea, which occurred in the summer of 1944, was a one-sided thing—a "turkey shoot." When we saw that the Japanese were staggering, we moved forward the invasion of Leyte, stimulating the last great naval battle—a close-run thing. The Japanese almost got their combat units in among MacArthur's amphibious forces, but we saved the day by the narrowest of margins. Thereafter, the main threat was the

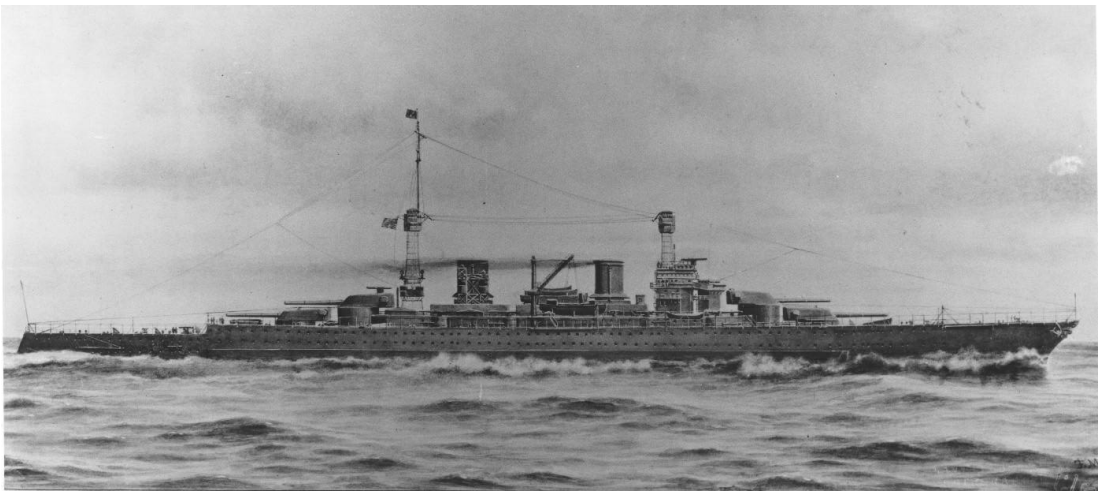

Photo courtesy of US Navy.

Artist's conception of the US navy battle cruiser Lexington*. The battle cruisers of the early twentieth century were capital ships with armament and propulsion similar to those of battleships. However, they did not have the same armor plating. The theory was that they could run away from battleships and outgun everything else afloat. But the British battle cruisers at Jutland suffered heavily, and the design lost favor before the Washington Conference.*

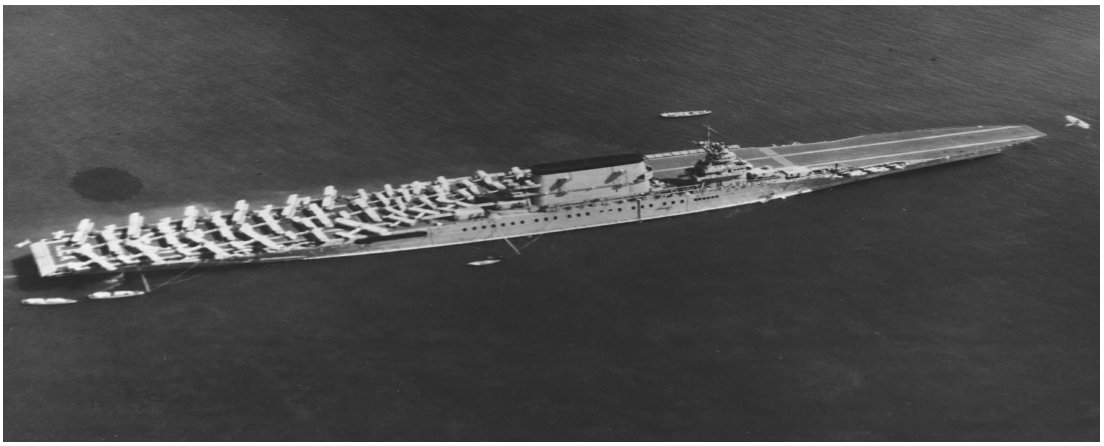

Photo courtesy of US Navy.

USS Lexington *at anchor, circa 1935. The Washington treaties permitted the United States to convert two battle-cruiser hulls to aircraft carriers, one of which became the* Lexington, *shown here, and the other the* Saratoga, *which was nearly identical. Both displaced 33,000 tons in accordance with the treaty limit and at first carried eight-inch guns. The* Lexington, *CV-2, was lost in May 1942 during the Battle of the Coral Sea. The* Saratoga *survived the war despite much battle damage and was sunk during one of the postwar nuclear tests.*

Photo courtesy of US Air Force.

Left to right: *President Franklin D. Roosevelt, Orville Wright, and Ohio governor James Cox, Wright Field, Ohio, 1940. President Roosevelt had been assistant secretary of the Navy during the Woodrow Wilson administration and a life-long fan of boats and ships. He was a great friend of the Navy, but by 1940 he had come to value airpower very highly and was developing the Air Corps as rapidly as he could. When he came to office in 1933, he immediately started rebuilding the Navy using public-works money.*

kamikazes, a problem to which we found no real solution before nuclear weapons precipitated the end. The United States Strategic Bombing Survey concluded that the combination of the submarine blockade and the strategic bombing of the home islands had proved decisive, but you may find it hard to persuade your carrier-flyer colleagues on joint staffs of the validity of that inference.

Arguably, the Navy became a victim of its own success. The German fleet had gone to the bottom at the end of World War I. Now the Japanese navy was out of the picture. The United States had command of the seas, and no one could challenge us. The British trea-sury would not support a great navy any more, and, in any event, war with Great Britain was unthinkable. The USSR was in no shape for a war; moreover, it was almost wholly a land power and not at all dependent on raw materials or food from overseas. So what threat justified the existence of the greatest navy in history?

As with the Army Air Service and Air Corps, naval aviators long felt that the "Gun Club" was denying them their rightful place in the sun. True, senior operational commanders in the Pacific did not cut their teeth in aviation.[3] But soon after Hiroshima, aviators began to take their places at the pinnacle of the profession. The first career aviator who became chief of naval operations was Forrest Sherman, who took office in 1949.

Revolt of the Admirals

The most memorable hours in my 70 years as an American were VJ-day, when the war ended. The whole city of Quincy, Massachusetts, poured into the square, smiling and joyful. Dour New England had rarely seen such public hugging and kissing. It was just great to be an American. Our monopoly on nuclear weapons and the new United Nations would guarantee world peace forevermore. The quick appearance

of cheap atomic power would wipe out poverty once and for all. Looking back, I am amazed by how fast that great feeling dimmed.

Arguably, that was also the greatest day in the history of the United States Navy. It had risen from the depths of despair at Pearl Harbor to the heights of its greatest glory in September 1945 at Tokyo on the quarterdeck of the battleship *Missouri* American carriers had won the naval war in the Pacific, and Navy aviators had come out of the wilderness poised to grasp the reins of power in their service. But the clouds of interservice rivalry soon masked the sunlight of that great victory.

The initial vision of the meaning of nuclear weapons was that they were so horrible that no one could ever stand up to them. If they did not inhibit war entirely, they were so deadly that one could not resist them for long. One assumed that they would never be much smaller than the 10,000 lb weapons dropped on Hiroshima and Nagasaki. Thus, only large, land-based aircraft could carry them. They would make such short work of war that neither blockades nor amphibious operations nor efforts at commanding the sea would have time to make any difference. In any event, who was left to blockade? Who challenged our command of the sea? Who had a submarine fleet that we could depth-charge? A two-ocean Navy was a relic of times gone by.

On top of that, the whippersnapper Air Force (Army Air Forces just then) had come on the Pacific scene with its B-29s and "nukes" at the last minute to hog all the glory that should have been the Navy's. The media quickly forgot the long grind through the Pacific islands and became fascinated with the nuclear marvels. Congress and especially the president were on the lookout for an "econo" way of providing national se

Photo courtesy of US Air Force.

First secretary of the Air Force, Stuart Symington, circa 1947. He and the two generals whose picutres are on the wall, Dwight Eisenhower and Carl Spaatz, were among the leading proponents of a Department of Defense and a separate air force. Symington was put under a cloud by charges coming from naval employees regarding corruption in the B-36 acquisition program, but Congress investigated the charges and exonerated the secretary.

curity. Perhaps we could do it with one air force and a few nukes instead of the huge, expensive Navy and Army.

All of that resulted in American military history's most vicious interservice battle—a debate over service unification and an independent air force. In form, Mitchell's dream came true—such an air force and a Department of Defense became reality. However, not one but three or four air forces emerged, and the Department of Defense was only a hollow shell of what Mitchell had envisioned—strictly limited in size and having power only to "coordinate." The separate existence and size of the US Marine Corps became chiseled into the stone of law, and naval aviation continued its existence as well—with a substantial element of land-based airpower. The Unification Act of 1947 did not really do much to settle things.

Early in 1948 President Harry Truman gathered the chiefs of staff down at the naval base at Key West, Florida, to attempt to bring more harmony and cooperation into the services; he held another such meeting at Newport, Rhode Island, later in the year. They did not work. Qualifications to the agreements hammered out soon made them meaningless. The US Air Force, the new kid on the block, drove hard to stake out the strategic-attack mission as its own private preserve. Part of this included acquisition of the B-36, a very long range bomber of truly massive proportions. The Navy, having lost so many missions, now tried hard to get a piece of the nuclear pie, partly out of its need to develop a carrier-attack airplane with a bomb bay big enough to hold a 10,000 lb weapon. This entailed building a new, flush-deck supercarrier—the *United States.* Although the Navy had previously embraced power projection ashore, that now threatened to become its principal mission, putting it in direct competition with the Air Force.

Secretary of Defense James V. Forrestal committed suicide about that time, and his replacement, Louis Johnson, promptly cancelled the building of the *United States,* setting off a major revolt among the admirals. The conflict produced anonymous accusations of corruption in the B-36 acquisition program and ultimately led to the relief of the chief of naval operations himself, Adm Louis Denfeld. Although Congress investigated the accusations and found no corruption by Secretary of the Air Force Stuart Symington or anyone else, the dawn of 1950 saw no end to the looming bureaucratic battles.

But in June 1950, the North Koreans invaded South Korea, stimulating an unexpected US military response. This new war, so soon after Hiroshima, dispersed the euphoria that had followed the defeat of the Japanese. It did, however, reopen the gates of the treasury for the armed forces, and soon the rivalry diminished greatly. The scarcity of jet airfields on the Korean peninsula enabled the carriers to demonstrate real utility even in a nuclear world without an obvious naval adversary. At the end of the Korean War, President Dwight Eisenhower, who had been a major proponent of unification and a separate air force, appointed Adm Arthur Radford as chairman of the Joint Chiefs of Staff. Eisenhower's selection of Radford, one of the main opponents of unification and a separate air force, symbolized interservice peace, as did the fact that in the 1950s the Navy got its authorization for the *Forrestal* class of supercarriers.

The new carriers, about the size intended for the *United States,* were not flush-decked, but that did not matter any more. By then, one could miniaturize nuclear weapons to the point that small carrier aircraft could carry them. By then, too, the Soviets were providing the threat upon which the Navy could build a new house.

The Blue-Water Navy and the Soviets

In 1945 the Soviets captured a good part of the German submarine fleet along with the supporting science and technology, transferring all of it to their homeland. Soon they began building a submarine fleet of their own, based mostly in their northern ports, and began to threaten US sea lines of

Photo courtesy of US Navy.

The USS Sam Rayburn, *a ballistic missile boat, circa 1960. One of the things that diminished the intensity of interservice rivalry in the late fifties and early sixties was the surprise appearance of a new technology—submarine launched ballistic missiles. This gave the Navy an important role in the nuclear-deterrence mission in a way not threatening to the Air Force and yet apparently very stabilizing to the nuclear balance.*

communications with NATO allies. They also followed the United States into the submarine launched ballistic missile (SLBM) business, which came to threaten the American homeland itself. All of this stimulated the rebuilding of the Navy's ASW capability, at first based on light surface combatants and airpower but later expanded to the use of attack submarines themselves as ASW platforms. The Soviets' actions also became part of the justification of a carrier-fleet nuclear mission that would not compete with the role of the Air Force: attacking the Soviet submarine menace at its source, also in its northern ports. All of that became a maritime strategy that in its most ambitious form called also for a naval attack on the right flank of the hypothetical Warsaw Pact charge to the westward. It reached its culmination during the administration of President Ronald Reagan.

Because of technological problems, the Navy lagged the Air Force a bit in the transition to an all-jet force. The early jets required a great length of runway for takeoff and accelerated slowly when their pilots elected to make a missed approach. The latter difficulty was especially dangerous because a late decision on the part of the pilot could easily result in a crash into aircraft that had previously landed on the foredeck, loaded with highly volatile fuel and munitions. Two British ideas, the steam catapult and the canted deck, ultimately overcame these problems. The catapult allowed the launch of heavily laden aircraft from minimum lengths, and the canted deck moved the landing area outwards so that an aircraft on a missed approach could take off straight ahead without going over airplanes on the forward end of the flight deck. The problems also diminished with the building of ever-larger carriers, culminating with the current *Nimitz* class at a displacement above 80,000 tons—three times the size of the *Essex* class of World War II vintage. But again, the heyday of the Reagan years did not last long and was undermined by the collapse of the USSR and the Warsaw Pact.

From the Sea

The disappearance of the Soviet threat hurt the submariners of the US Navy the most. Both parts of their mission, ASW and SLBM, focused almost exclusively on the USSR, and neither adapted easily to other kinds of conflict. But the aircraft carriers proved more adaptable. They had demonstrated a high utility in the early days of the Korean War, a limited conflict resembling the diffuse threat now seen in the American future. Since no one had anticipated Korea, no elaborate bases existed to which we could deploy land-based air units. Similarly, since it is difficult to predict future areas of conflict, the portable airfields on aircraft carriers gain

Photo courtesy of Lt Col Mason Carpenter, US Air Force.

US Navy F-14 Tomcat refueling from US Air Force tanker, Gulf War, 1991. The Tomcat is a 1970s-era design, optimized for air-to-air work based on the "lessons" of the Vietnam War. In the Gulf War, it was still confined to work in the air-to-air battle using AIM-7 Sparrows, AIM-9 Sidewinders, and AIM-54 Phoenix air-to-air missiles. It also had an M-61 20 mm cannon, but missiles did all its kills. Since the war, it has been modified with bomb racks and the capability to employ navigation and targeting pods to give it an air-to-ground capability as well.

some utility. One can also vary their deck loads to adapt to many different conflict scenarios—something not possible for submarines.

The Navy's new "From the Sea" strategy allows for no blue-water threat—no great battle for the command of the surface of the sea or the region below the surface. Too, the future adversary is beyond prediction—the threat is diffuse. But most important places are only a short distance from the sea, many accessible by amphibious forces composed of naval and marine units. Future conflict will likely occur not in the open ocean but along the shore—the littoral—in the brown-water area so long considered a backwater for the US Navy. This is the province of amphibious and mine-warfare forces, both of which take on a new prominence under the "From the Sea" concept. The idea is that the Navy and Marine Corps have the special capability to make surprise invasions that can force entry into an enclave which will then supply the base area for the heavier Army and Air Force forces—if heavier forces are needed at all. Aircraft carriers are essential for this kind of war, and some ASW capability is necessary as well to protect the power-projection force from small submarine attacks.

For the readers of *Airpower Journal,* a whole new airpower world waits to be examined. It is alien to many of us, but—fortu-

Photo courtesy of Lt Col Mason Carpenter, US Air Force.

US Navy EA-6 Prowler refueling by the probe-and-drogue method from a US Air Force tanker during the Gulf War, 1991. The Prowler's mission is defense suppression, either nonlethal, using electronic jamming, or lethal, launching antiradiation missiles at radar sites.

nately—a huge and interesting literature describes it. It behooves the Air Force's young warrior-scholars, such as you, to become somewhat familiar with maritime airpower and the sea services through the vicarious experience of reading some or all of the works on the sampler list below. If you have the chance to experience carrier operations at sea, by all means grasp it. Doing so will add greatly to your education and at the same time serve as a fascinating interlude.

Five New Books on Airpower at Sea

Air Warriors: The Inside Story of the Making of a Navy Pilot by Douglas C. Waller. Simon & Schuster, New York, New York, 1998, 416 pages, $25.00.

Waller, a *Time/Newsweek* journalist specializing in national security, is a strong writer but a dilettante in matters of aviation. He bases his book very largely on short tours at Pensacola and on shipboard, a few flights, and many interviews. Some journalistic bias turns up in his tendency to take the words of ensigns and lieutenants at face value while viewing everybody over 30 with suspicion. If you are at all inclined to the subject, go on to Baldwin's *Ironclaw,* below.

Destined for Glory: Dive Bombing, Midway, and the Evolution of Carrier Airpower by Thomas Wildenberg. Naval Institute Press, Annapolis, Maryland, 1998, 280 pages, $34.95.

This book, written by a serious naval historian who is now a scholar at the National Air and Space Museum, shows how dive-bombing and carrier aviation developed during the last decade before the war to produce a true ship-killing capability that really could decide battles at sea. This work is worth your time because it effectively relates technology, doctrine, and organization in a way that will enhance your understanding.

Ironclaw: A Navy Carrier Pilot's Gulf War Experience by Sherman Baldwin. William Morrow, New York, New York, 1996, 265 pages, $24.00.

Baldwin is a qualified carrier pilot with a strong writing style. Although his book overlaps Waller's to some extent, Baldwin writes engagingly and with a good deal more authority. This book will give you some of the flavor of the day-to-day life aboard carriers and some insights into coping with the prospects of and actual combat.

Sea Wolf: A Biography of John D. Bulkeley by William B. Breuer. Presidio Press, Novato, California, 1989, 318 pages, $16.95.

This is a chest-thumping, hero-worshiping biography done by a prolific author supplying the market for popular history. Because it contains very little on airpower, you can skip this one or go back to William Lindsay White's *They Were Expendable* (1942) for the story of the deliverance of Gen Douglas MacArthur on PT boats in 1942.

U.S. Marine Corps Aviation, 1912 to the Present, 3d ed., by Peter B. Mersky. Nautical and Aviation Publishing Co., Baltimore, Maryland, 1997, 383 pages, $29.95.

Written by a short-service Marine aviation veteran, this book is a mind-numbing listing of every unit and ace pilot in the history of the corps, with little analysis of Marine air doctrine and still less of an effort to place it in context. Skip this one in favor of the Sherrod, Cagle and Manson, and Uhlig books listed in the sampler, below. Of the five works listed here, I would give the Wildenberg work a fairly high priority and then recommend Baldwin's for lighter but informative reading. The rest, you can skip.

A 10-Book Sampler on Naval Aviation for Your Professional Reading Program

Baer, George W. *One Hundred Years of Sea Power: The U.S. Navy, 1890–1990*. Stanford, Calif.: Stanford University Press, 1994.
See pages 125–27 for the context in which naval aviation developed.

Barlow, Jeffrey G. *The Revolt of the Admirals: The Fight for Naval Aviation, 1945–1950*. Washington, D.C.: Naval Historical Center, 1994.
Written by a Washington Navy Yard employee whose father is a naval aviator; that shows, but the book is nonetheless authoritative.

Buell, Thomas B. *Master of Seapower: A Biography of Fleet Admiral Ernest J. King*. Boston: Little, Brown, 1980.
A model biography that yields important insights into the development of naval aviation during the 1930s and World War II.

Cagle, Malcolm W., and Frank A. Manson. *The Sea War in Korea*. Annapolis: US Naval Institute Press, 1986.
Written by two experienced naval officers (Cagle became an admiral); includes good chapters on naval air in Korea.

Reynolds, Clark G. *Admiral John H. Towers: The Struggle for Naval Air Supremacy*. Annapolis: US Naval Institute Press, 1991.
The life story of a pioneer naval aviator—strong on the early days down to the end of World War II.

Sherrod, Robert. *History of Marine Corps Aviation in World War II*. Washington, D.C.: Combat Forces Press, 1952.
A survey of the subject down to the end of World War II—still authoritative.

Trimble, William F. *Admiral William A. Moffett: Architect of Naval Aviation*. Washington, D.C.: Smithsonian Institution Press, 1994.
A first-class description of the role of Moffett, who was not a pilot but nonetheless crucial to the way in which naval aviation developed.

Turnbull, Archibald D., and Clifford L. Lord. *History of United States Naval Aviation*. New Haven: Yale University Press, 1949.
The classic overview of naval aviation down to the end of World War II—still valid.

Uhlig, Frank, Jr. *Vietnam: The Naval Story*. Annapolis: US Naval Institute Press, 1986.
Contains a good chapter on naval aviation by Vice Admiral Cagle and another by Lt Gen Keith B. McCutcheon on Marine aviation in South Vietnam.

Winnefeld, Adm James A., and Dr. Dana J. Johnson. *Joint Air Operations: Pursuit of Unity in Command and Control, 1942–1991*. Annapolis: US Naval Institute Press, 1993.
Explains the success of the Solomons joint air campaign compared to most others. The authors discuss Operation Desert Storm, deeming it more successful in unified effort than either Korea or Vietnam.

One for Good Measure

Melhorn, Charles M. *Two-Block Fox: The Rise of the Aircraft Carrier, 1911–1929* Annapolis: US Naval Institute Press, 1974.
The classic work on the foundations of naval aviation.

Notes

1. William Briggs Hall, the first man in the class, resigned at the onset of the Civil War, leaving Mahan as the top graduate on active duty for most of his service. *Register of Alumni, Graduates, and Former Naval Cadets and Midshipmen* (Annapolis: United States Naval Academy Alumni Association, 1992), 149.

2. For an authoritative source on the life of Mahan, see Robert Seager II, *Alfred Thayer Mahan: The Man and His Letters* (Annapolis: Naval Institute Press, 1977). Mahan's triumph was *The Influence of Sea Power upon History, 1660–1783* (Boston: Little, Brown, 1890).

3. Adm Chester Nimitz had been in submarines and cruisers. Adm Ernest King, chief of naval operations, had wings, but he had won them as an O-6 and never served in a squadron. Adm William Halsey also won his wings as an O-6. Adm Raymond Spruance, the victor at Midway, was a cruiser sailor. Finally, Adm Marc Mitscher, the seniormost leader and one of Spruance's task-force commanders in the Fifth Fleet, had been in aviation from the ground up.

In any moment of decision the best thing you can do is the right thing, the next best thing is the wrong thing, and the worst thing you can do is nothing.

—Theodore Roosevelt